TELECOM REGULATORY AUTHORITY OF INDIA

**Mahanagar Doorsanchar Bhavan,
Jawaharlal Nehru Marg (Old Minto Road),
New Delhi – 110 002**

TENDER DOCUMENT FOR
RANDOM REAL TIME MONITORING OF
QUALITY OF SERVICE OF SERVICE PROVIDERS IN
DELHI SERVICE AREA

17th September 2013

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TENDER DOCUMENT FOR RANDOM REAL TIME MONITORING

Invitation of Bids for Random real time monitoring of Quality of Service of Service Providers

Notice Inviting Tender

1.   Telecom Regulatory Authority of India, Mahanagar Doorsanchar Bhavan, Jawaharlal Nehru Marg (Old Minto Road), New Delhi – 110002 (hereinafter referred to as TRAI) invites sealed tender from companies/ firms (hereinafter referred to as agency), who satisfy the following eligibility conditions for conducting random real time monitoring of quality of service of service providers in Delhi Service area, in terms of the benchmarks specified in the "The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009 (7 of 2009) dated 20th March, 2009 namely:-

(i)   the agency should have a turnover of not less than rupees one crore during the financial year 2012-13 and should have a minimum cumulative turnover of rupees three crores in the last three consecutive financial years;

(ii)   the agency should have similar experience of at least two years in conducting random real time monitoring or RF drive test, of Quality of Service and should have sufficient staff and infrastructure to carry out the random real time monitoring of Quality of Service as per the Terms of Reference; and

2.   A copy of the Tender Document is available at TRAI's website www.trai.gov.in and may be downloaded for submission purpose. **The agency shall submit technical as well as financial bids in separate sealed covers.** The bidder shall submit for both Technical and Financial bid one set marked as 'Original Bid' along with 4 copies of the same marking as 'Copy No.1, Copy No.2, Copy No.3, Copy No.4'. In the event of any discrepancy between the copies, the Original shall govern. Each page of the tender document and clarifications/corrigendum issued, if any, is to be signed in token of the companies/firms having read and accepted the terms and conditions. The name, address, Fax number, telephone/mobile number and e-mail of the bidder should clearly appear on the envelope. The Tender name and date of Tender opening should also appear on the envelope.

4.   The bid, complete in all respects, should be submitted, not later than 3.00 PM on **23rd October, 2013**, to Joint Advisor (QoS), Telecom Regulatory Authority of India, Room No.522, 5th Floor, Mahanagar Doorsanchar Bhavan, Jawaharlal Nehru Marg (Old Minto Road), New Delhi-110 002. The technical proposals will be opened at **3.30 PM on 23rd October, 2013**. If they so desire, the bidders may be present at the time of opening of the bids. A pre-tender conference will be held with the prospective bidders on **1st October 2013 at 3.00 PM** in the Conference Hall of TRAI on 3rd Floor, Mahanagar Doorsanchar Bhavan Jawaharlal Nehru Marg (Old Minto Road), New Delhi-110002. The prospective agency may, on their own, attend the said conference without waiting for any further communication.

5.   **Unsealed bids or bids without the earnest money deposit as prescribed in the tender document shall be summarily rejected**.

6.   **Late Bids:** The bids received, either by post or in person, after the due date and time of submission of bids shall be returned unopened.

7.   The agencies may be required to give a presentation on the technical aspects and their ability to perform the work for which date will be advised separately.

(Shaji Abraham)
Joint Advisor (QOS)

SECTION- I

TENDER CONDITIONS AND INSTRUCTIONS TO BIDDERS

1.   Background

1.1   Telecom Regulatory Authority of India vide its Regulations "The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service, 2009 (7 of 2009) Regulations, 2009" dated the 20th March, 2009 published in the Gazette of India Extraordinary Part-III-Section 4 dated the 23rd March, 2009 has laid down the Quality of Service parameters applicable to the basic telephone service (wireline) and cellular mobile telephone service. A copy of the said regulations is available at TRAI website www.trai.gov.in. These regulations are applicable to all the Basic Telephone Service Providers/ Unified Access Service Providers and Cellular Mobile Telephone Service Providers, including BSNL and MTNL. Regulations 5 and 6 provide for QoS parameters pertaining to Cellular Mobile Telephone Service.

2.   Clarification on Tender Document and Pre-Tender Conference

2.1   A prospective bidder, requiring any clarification on the tender document shall submit in writing the request for any clarification not **later than 4.00 PM on 26th September, 2013 to Joint Advisor (QoS),** Telecom Regulatory Authority of India, 5th Floor, Mahanagar Door Sanchar Bhavan, Jawaharlal Nehru Marg (Old Minto Road), New Delhi-110002 (FAX No. 011-23213036). Copies of the query (without identifying the source) and clarifications by TRAI shall be uploaded on the TRAI website.

2.2   Any clarification issued by TRAI in response to query raised by prospective bidders shall form an integral part of tender document and it may amount to an amendment of relevant clauses of the tender document.

2.3   The bidders are required to keep a watch on the TRAI Website www.trai.gov.in for any amendment to the tender document or for clarifications in response to the queries raised by the bidders up to a day prior to the last date for submission of bids. TRAI reserves the right to reject any bids if the bids are submitted without taking into account these amendments/ clarifications. Further, the prospective bidders shall be fully responsible for downloading of the amendments, if any, made in the tender document and clarifications, if any issued by TRAI and TRAI accepts no responsibility whatsoever in this regard.

3.   Earnest Money Deposit (EMD)

3.1   The prospective agency shall submit along with their bid a bank draft for a sum of **Rs.1,00,000 (Rupees One Lakh only)** drawn on any scheduled bank in favour of "TRAI" payable at Delhi as earnest money. Any bid not accompanied by earnest money shall be summarily rejected. **The EMD shall be submitted with the Technical Bid**. No interest shall be payable on the EMD submitted with TRAI. The earnest money shall be refunded to the unsuccessful bidders after finalisation of the tender. The EMD will be returned to the successful bidder after signing of the agreement.

3.2   The EMD may be forfeited in any of the following circumstances:

  (a)   If the bidder withdraws his bid during the period of validity of bids.
  (b)   In the case of successful bidder, if the bidder fails:
        (i)   to sign the agreement; or
        (ii)   to furnish Performance Bank Guarantee in accordance
              with Clause 9 of this Section.

4.   Eligibility

4.1   The companies/firms (hereinafter referred to as agency) who satisfy the following conditions are eligible for bidding, namely:

  (i)   The agency should have a turnover of not less than rupees one crore during the financial year 2012-13 and should have a minimum cumulative turnover of rupees three crores in the last three consecutive financial years.

  (ii)   The agency should have similar experience of at least two years in conducting random real time monitoring of Quality of Service or RF drive tests and should have sufficient staff and infrastructure to carry out the random real time monitoring of Quality of Service as per the Terms of Reference; and

4.2   The agency should submit documentary evidence regarding fulfilment of the above eligibility conditions including the income tax clearance/ IT Certificate and PAN Number.

5.   Terms of Reference

The Terms of Reference for random real time monitoring of Quality of Service provided by service providers is given in **Section-II**.

6.   Schedule for Financial Bids

Schedule for Financial Bids is available at **Section-III.** The quotation shall include all levies, duties and taxes including service tax.

7.   Technical Proposal

Standard formats for technical proposal are given in **Section-IV**. All the necessary details are required to be filled by the bidders and submitted before the last date and time of submission.

8.   Last date (due date) for submission of bids

The bid should be submitted not later than **03.00 PM** on **23rd October 2013.** Any bid received after this specified date shall be rejected and returned unopened to the bidder.

9. Performance Bank Guarantee Bond

9.1 The selected agency shall furnish a Performance Bank Guarantee in the proforma given at **Annexure-1** from any scheduled Bank in India within 15 (fifteen) days from the date of receipt of the letter of acceptance by the agency for an amount equivalent to 10% (ten per cent) of the value of the contract before signing of the contract. In case the furnishing of an acceptable Performance Bank Guarantee is delayed by the agency beyond the afore-mentioned period, TRAI may cancel the said letter of acceptance and forfeit the Earnest Money Deposit (EMD) made by the agency. Initially, the bank guarantee(s) shall be valid for a period of two years and six months. The agency on its own shall extend the validity period of the bank guarantee(s) on similar terms at least one month prior to the day of its expiry without any demand or notice from the TRAI. The bank guarantees shall be kept valid for an extended period of six months beyond the period of agreement. Any failure to do so, shall amount to violation of the terms of the agreement and entitle the TRAI to encash the bank guarantee(s) and to convert it into a cash security without any reference to the agency at its risk and cost. No interest or compensation whatsoever shall be payable by the TRAI on such encashment. On satisfactory completion of the contract in all respects, as per the terms and conditions specified in the tender document and contract agreement the Performance Bank Guarantee bond shall be returned to the agency. No interest in any form shall be payable by TRAI to the agency before or after expiry of the Performance Bank Guarantee.

9.2 In case the agreement is extended to cover random real time monitoring for one more year, the agency shall submit, within 15 (fifteen) days of intimation about such extension by TRAI, a fresh Performance Bank Guarantee for amount equivalent to 10% (ten per cent) of the value of the contract for the extended period or extended work, as the case may be, in similar manner and shall also extend by one year the validity of such second bank guarantee one month before its expiry in the same manner as indicated in clause 9.1 above.

9.3 Without prejudice to its rights to terminate the contract and to pursue any other remedy available to it under the law, TRAI may forfeit full or part of the Performance Bank Guarantee in case –

(i) the agency fails to carry out the assigned task as per the terms and conditions specified in the tender document and contract agreement; or
(ii) the report is not as per the format approved by TRAI; or
(iii) the report contains information, which is found to be factually incorrect or materially wrong by TRAI.

10. TRAI's right to accept or reject a bid without assigning any reason

TRAI reserves the right to accept or reject any bid without assigning any reason.

11. Opening and evaluation of the Bid

11.1 The bids shall be evaluated by the Tender Evaluation Committee based on both techno-commercial and financial aspects as stipulated in this tender document.

11.2 The technical bids will be technically evaluated giving due consideration to the agency's conformity with the tender conditions, its capability to perform the assignment, past experience in carrying out works of similar nature, profile of personnel to be engaged for this assignment and financial capability. The agencies may be called to make presentation to the tender evaluation committee constituted for this purpose. They shall furnish the clarifications/ detailed explanations, if sought, on the technical proposals by TRAI or by the tender evaluation committee.

11.3 The financial bids, of only those bidders who qualify in the evaluation of the technical bids, will be opened and evaluated. Total quoted price will be taken for ranking of bids from lowest quoted to highest quoted. Arithmetical errors shall be rectified on the following basis:-

> "If there is a discrepancy between words and figures, the amount in words shall prevail. If there is discrepancy in the total arrived at and the rates quoted, the total shall be corrected taking into account the rates quoted for different items in the financial bid. If the bidder does not accept the correction of the errors, his bid shall be rejected".

11.4 In situations where lowest quoted rates (L1) of two or more bidders are same, in such cases fresh round of financial bidding from such bidders shall be called. The lowest valid offer shall be declared successful.

11.5 TRAI reserves the right to award the work to any other outside agency or organization at its discretion and the successful bidder shall have no objection to the awarding of such work to such outside agency or organization on the ground that such outside agency or organization has not participated in the tender process and to the corresponding reduction in the total bid amount quoted by the successful bidder.

12. Validity of Contract

The contract for undertaking random real time monitoring of Quality of Service of service providers will be valid for a period of 12 (twelve) months from the date of signing of the agreement, covering random real time monitoring of Quality of Service for six months covering the entire Delhi service area.

13. Force Majeure

13.1 If the performance in full or part as specified in the contract is prevented, restricted, delayed or interfered by reasons of-

    i)   fire, explosion, cyclone, floods;

    ii)   war, revolution, acts of public enemies, blockage, or embargo;

iii) any law, order, proclamation, ordinance, demand or requirements of any Government, or authority or representative of any Government, including restrictive trade practices or regulations;

iv) strikes, shut-downs or labour disputes which are not instigated for the purpose of avoiding obligations herein; or

v) any other circumstances beyond the control of the party affected;

then, notwithstanding anything contained hereinbefore, the party affected may be excused from its performance to the extent such performance relates to such prevention, restriction, delay or interference, provided the party so affected uses its best efforts to remove such cause of non-performance, and when removed, the party shall continue performance with utmost urgency.

13.2 If at any time during the performance of the contract, the agency should encounter condition impeding timely completion of the work, the agency shall promptly notify to the TRAI in writing the fact of the delay, its likely duration and its causes. As soon as practicable after receipt of the notice of agency, the TRAI may evaluate the situation and may at its discretion extend the period for performance of the contract after mutual discussion with the agency.

14. Termination:

14.1 TRAI reserves the right to terminate the contract (i) if the agency fails to carry out the work as per the terms and conditions in the tender documents/contract or (ii) if the reports are delayed or (iii) if the reports are materially incorrect. The decision of TRAI as regards such material incorrectness of the report shall be final and binding on the agency.

14.2 Delivery of the performance of the work shall be made by the agency in accordance with the time schedule specified by TRAI. In case the work is not completed in the stipulated delivery period, as indicated in the contract, TRAI reserves the right to foreclose/cancel this contract and/or impose a penalty as per clause 17. The cancellation/foreclosing of the contract shall be at the risk and responsibility of the agency and TRAI reserves the right to get the work completed for remaining part at the risk and cost of the defaulting agency.

15. Indemnity

In no event shall TRAI be liable to agency for special, direct, indirect or any other damages in connection with or arising out of the furnishing performance or use of services provided by the agency under this contract. The agency shall indemnify TRAI in respect of any damages, claim, loss or action against TRAI for act of commission or omission on the part of the agency, its agents or servants.

16.   Coordination

16.1   The agency shall appoint one of its employees as coordinator who shall represent the agency in all dealings with TRAI.

16.2   All correspondence relating to the Tender shall be addressed to Joint Advisor (QOS), Telecom Regulatory Authority of India, Mahanagar Doorsanchar Bhavan, New Delhi-110 002.

17.   Payment terms:

17.1 Payment shall be made after completion of random real time monitoring of quality of service and submission of the reports as per the following schedule and after TRAI is satisfied that the report submitted by the agency complies with the formats, norms and quality specified in the agreement:-

Sl. No.	Schedule	% payment in terms of total payment for one year
1.	Commissioning of the random real time monitoring system and submission of all final reporting formats by the agency for random real time monitoring incorporating modifications/ corrections suggested by TRAI and its acceptance	Ten percent (10%) of the total contract price.
2.	Submission of consolidated quarterly reports of the random real time monitoring system conducted during the first quarter and acceptance of the report by TRAI	Forty five percent (45%) of the total contract price.
3.	Submission of consolidated quarterly reports of the random real time monitoring system conducted during the second and final quarter and acceptance of the report by TRAI. Also making over of all equipment as per schedule-I.	Forty five percent (45%) of the total contract price.

17.2   The work of random real time monitoring of Quality of Service in Delhi LSA shall be completed and all the reports shall be submitted within the respective time limits as specified in the tender or agreement. The online reports are to be submitted online and the consolidated reports are to be submitted on quarterly basis. No extension of the time for completion of the work and for submission of the report thereof shall be given, except for exceptional circumstances which, in the opinion of TRAI, necessitate such extension.

Penalty:

17.3 In case the *quarterly* consolidated reports of the random real time monitoring of Quality of Service is delayed a penalty shall be levied by TRAI at the rate of –

(a) 5% (five per cent) of the value of *quarterly* contracted work for random real time monitoring of Quality of Service, for the first week of delay;

(b) 5% (five per cent) of the value of *quarterly* contracted work for random real time monitoring of Quality of Service, for the second week of delay;

(c) 40% (forty per cent) of the value of *quarterly* contracted work for random real time monitoring of Quality of Service, for delay beyond two weeks and up to four weeks;

which shall be deducted from the amount payable to the agency by TRAI. In case the *quarterly* consolidated quarterly report for random real time monitoring of Quality of Service is delayed beyond four weeks the report shall not be accepted and no payment shall be made by TRAI for such delayed report submitted after four weeks of due date for submission of the report.

17.5 In case the report is found by TRAI to be materially or factually incorrect or is not as per the format of report approved by TRAI, the report is liable to be rejected and no payment will be made for such contracted work if rejected by TRAI and TRAI may also forfeit and encash the Performance Bank Guarantee. The decision of TRAI as regards such material or factual incorrectness of the report shall be final and binding on the agency.

17.6 In any specific case where the report submitted by the agency for any *quarterly* period is having deficiency in respect of any of the parameters specified in the format of the report approved by TRAI or the extent of work as carried out by the agency falls short of the prescribed quantum and the parameters or the quantum of work so left incomplete does not exceed ten per cent of the total parameters or quantum of work, the report will be treated as by TRAI to be incomplete. Also the non-completion of such parameters/quantum of work does not impact the report in general and it is possible to make comparison of performance of all the service providers in the respective Service Area for various parameters of quality of service covered under the assignment, or where such comparison of performance of all the service providers is impacted by such incompleteness of the work/report in only one service area, TRAI may, at its discretion, accept such a report;

Provided that the payment for such incomplete report shall be reduced by-

(a) ten percent of the total payment for the *quarterly* period to which such report pertains, if the report does not impact the comparison of performance of the service providers in Delhi LSA covered in the *quarterly* period:

Provided further that in case for the *quarterly* period to which such report pertains, if the deficiency or incompleteness of any parameters or quantum of work in such report impacts the report itself and it is not possible to make a comparison of the performance of all the service providers in Delhi LSA or the uncompleted portion of the work is more than ten percent in the service areas covered in the *quarterly* period, such report shall not be accepted by TRAI and no payment whatsoever will be made for the entire *quarterly* report and such non-payment for the *quarterly* report shall be without prejudice to the rights of TRAI to foreclose or cancel the contract and that such foreclosure or cancellation of the contract shall be at the risk and responsibility of the agency and that TRAI shall be free to get the work completed for the remaining part of the contract at the risk and cost of the agency. The Performance Bank Guarantee of the agency shall also be forfeited in such cases.

Provided also that the decision of TRAI as regards the acceptability of such *quarterly* reports and the quantum of payment for such *quarterly* report shall be final and binding on the agency.

18. Confidentiality

18.1 The bidder shall treat all the information provided by the TRAI as confidential and shall not share this information without the written permission of the TRAI. The reports, data, etc. submitted by the bidder shall be the exclusive property of TRAI and the bidder shall not disclose the contents of such reports, data, results, etc. to any third party without the written consent of TRAI. This condition shall survive the termination of the contract with the bidder.

18.2 All information gathered during the random real time monitoring of Quality of Service and reports will be the sole property of TRAI. The agency will not transfer / pass on the information of one service provider to another service provider or to any third party under any circumstances.

18.3 The Bidder shall not publish, disclose any information about, make available or otherwise dispose of the document /data / software or any part or parts thereof to any third party, directly or indirectly without prior written consent of TRAI.

18.4 The bidder shall restrict access to the documents / data / software only to those of their employees to whom it will be felt necessary and relevant for this project and shall draw the provision of this undertaking to the personal attention of those of its employees to whom access to the document/data/software will be granted.

18.5 The bidder shall bear all costs associated with the preparation and submission of the bid. The Authority will, in no case, be responsible or liable for these costs, regardless of the conduct or outcome of the biding

19. Laws governing contract

The laws of India in force for the time being shall govern the agreement.

20. Jurisdiction of courts

The courts of law located at New Delhi/Delhi shall alone have the jurisdiction to decide any dispute arising out of or in respect of the agreement entered into pursuant to this tender.

21. Arbitration

In the event of any dispute arising between the TRAI and the agency, the matter shall be referred to the Secretary, TRAI who may himself act as sole arbitrator or may name as sole arbitrator an officer of the TRAI notwithstanding the fact that such officer has been directly or indirectly associated with the tender process or the contract between the parties. The agency shall not be entitled to raise any objection to the appointment of such officer of TRAI as the sole arbitrator. The award of the arbitrator shall be final and binding on both the parties, subject to the provisions of the Arbitration and Conciliation Act, 1996 and rules made thereunder for the time being in force. The parties expressly agree that the arbitration proceedings shall be held at New Delhi. The language of arbitration shall be English.

22. Language of the bid:

The bid shall be submitted in the English language.

23. Currency for the financial bid:

The financial bid shall be quoted in Indian Rupees (INR). The bid shall be inclusive of all taxes, levies and duties including service tax etc. Any change in any prevailing tax structure or imposition of any new tax by the competent authority shall be borne by the agency.

24. Bid validity period:

The bid shall remain valid for 120 (one hundred twenty) days from the date of submission of the bid.

25. Further assigning of tender in whole or part:

The agency shall not assign or make over contract, the benefit or burden thereof to any other person or persons or body corporate. No under letting or subletting to any person or body corporate for the execution of the contract or any other part thereof is permitted under any circumstances.

26.   False information:

In the event of furnishing false/incorrect information by the agency the EMD in respect of such agency shall be forfeited. Further, during the performance of the contract, it is detected that the contract has been obtained by furnishing the false/incorrect information in the tender, the agreement is liable to be terminated and performance bank guarantee and other payments due to agency shall be forfeited and the agency shall be liable to be blacklisted.

TERMS OF REFERENCE FOR RANDOM REAL TIME MONITORING OF QUALITY OF SERVICE OF SERVICE PROVIDERS

1. Objective:

1.1 Telecom Regulatory Authority of India has been entrusted to lay-down the standards of quality of service to be provided by the service providers and ensure the quality of service and conduct the periodical audit of such services provided by the service providers so as to protect the interest of the consumers of telecommunications service.

1.2 The Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service, Regulations, 2009 (7 of 2009) dated 20th March, 2009 specify benchmarks for the parameters on Quality of Service (QoS) to be achieved by service providers. A copy of the said regulations is available at TRAI's website www.trai.gov.in. The objective of the Terms of Reference is to carry out random real time monitoring of quality of service of service providers in Delhi LSA. For this purpose, TRAI wants to engage an agency for random real time monitoring of Quality of Service of service providers for Cellular Mobile Telephone Services in Delhi LSA, as per the scope of work indicated in clause 2.

1.3 The scope of work for random real time monitoring of Quality of Service of service providers includes:

(a) Installation of remote subscriber probes/agents so as to meet tender requirements.

(b) Moving these probes/agents so as to cover the desired number of BTS' in the Delhi LSA and 90% of the coverage area in accordance with the requirements.

(c) Transfer of data generated by the probes to the central server (cloud or physical) on real time basis through VPN.

(d) Generation of reports from the data pushed to the TRAI server, including provision of dash board.

1.4 S. No. (i) to (x) of regulation 5 pertaining to QoS parameters for Cellular Mobile Telephone Service specified under the Standards of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service Regulations, 2009 (7 of 2009) dated the 20th March, 2009 contain the parameter and benchmarks of the Quality of Service to be achieved by the service providers.

1.5 The parameters of Quality of Service for cellular mobile telephone services are specified under the head (A) Network Service Quality Parameters (B) Customer Service Quality Parameters. The Network Service Quality Parameters include the parameters related to (i) Network Availability (ii) Connection Establishment, (iii) Connection Maintenance (iv) POI Congestion. The Customer Service Quality Parameters include metering and billing credibility (postpaid and prepaid), resolution of billing/charging complaints,

period of applying credit/waiver/adjustment to customer's account, response time to the customer for assistance, termination/closure of service and time taken for refund of security deposit after closures. The parameter related to the Service coverage is to be audited and monitored during drive test.

1.6 The detailed explanation and measurement methodology of each parameters and benchmarks for Cellular Mobile Telephone Service and Broadband Service are given in the Explanatory Memorandum of the regulations mentioned in Clause 1.2.

(i) Cellular Mobile Telephone Service:

Serial Number	Name of Parameter	Benchmark	Averaged over a period
A	Network Service Quality Parameters:		
(i)	Network Availability		
	(a) BTSs Accumulated downtime (not available for service)	≤ 2%	One Month
	(b) Worst affected BTSs due to downtime	≤ 2%	One Month
(ii)	Connection Establishment (Accessibility)		
	(a) Call Set-up Success Rate(within licensee's own network)	≥ 95%	One Month
	(b) SDCCH/ Paging Channel Congestion	≤ 1%	One Month
	(c) TCH Congestion	≤ 2%	One Month
(iii)	Connection Maintenance (Retainability)		
	(a) Call Drop Rate	≤ 2%	One Month
	(b) Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 5% upto 31.03.2011 ≤ 3% From 01.04.2011	One Month
	(c) connections with good voice quality	≥ 95%	One Month
(iv)	Point of Interconnection (POI) Congestion (on individual POI)	≤ 0.5%	One Month

B	Customer Service Quality Parameters:		
(v)	Metering and billing credibility – post paid	Not more than 0.1% of bills issued should be disputed over a billing cycle	One Billing Cycle
(vi)	Metering and billing credibility –– pre-paid	Not more than 1 complaint per 1000 customers i.e. 0.1% complaints for metering, charging, credit, and validity	One Quarter
(vii)	(a) Resolution of billing/ charging complaints	100% within 4 weeks	One Quarter
	(b) Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	within 1 week of resolution of complaint	One Quarter
(viii)	Response Time to the customer for assistance		
	(a) Accessibility of call centre/ customer care	≥ 95%	One Quarter
	(b)Percentage of calls answered by the operators (voice to voice) within 60 seconds	≥ 90%	One Quarter
(ix)	Termination/ closure of service	≤ 7 days	One Quarter
(x)	Time taken for refund of deposits after closures	100% within 60 days	One Quarter

2.   Scope of work:

2.1   The main purpose of the tender is to monitor the Quality of Service rendered by the service providers providing Cellular Mobile Telephone Service on the basis of random real time monitoring by simulating actual user activity.

2.2   The random real time monitoring of various parameters/KPIs for assessing quality of service being provided by the Cellular Mobile Telephone Service providers shall be implemented **on managed services basis**. However the equipments as per schedule –I are to be handed over to TRAI. The Agency shall install at least two numbers of Remote Subscriber/probes/agents located at different locations in Delhi LSA. These probes will be fixed or nomadic. The agency shall install probes in Delhi LSA over a period of 180 days in such a manner that the quality of service of

each service provider in Delhi LSA is tested. At least 90% of the geographical coverage area contained in Delhi LSA has to be covered as per the RF coverage plot in such monitoring. The monitoring will be for duration of 10 hours in a day; 5 hours in the morning from 8.00 hrs to 13.00 hrs and 5 hours in the evening from 16.00 hrs to 21.00 hrs; covering TCBH shall be termed as tested for 'one day'. The probe needs to be moved within the Delhi LSA to cover at least 90% of the area, instead of keeping it stationary, thereby requiring vehicle mounted systems. These agents/probes may be finally connected to Central/Application/ Database servers, through a secure VPN connection, which are positioned at the premises of TRAI, New Delhi or at any other location within New Delhi. These probes/ multiplexers will monitor Quality of Service parameters in each of these service areas and shall upload the captured data on real time basis to the central servers. Total number of BTS in Delhi LSA for each service provider and their customer base are given below. At least two probes to be utilised.

2.3   The project will be implemented so as to cover the Licensed Service Areas (LSA) in two consecutive quarters of three months each. Only the Delhi LSA to be covered.

2.6   The solution implemented by the Agency shall have a coherent security system to protect it from malicious attacks and accidental damage from both internal and external sources. The Agency shall inform and demonstrate to TRAI the security architecture of the solution that will allow this requirement to be fulfilled. Of particular interest is the method of authentication and access control implemented in the solution that will be used to secure the system from "hackers".

2.7   The system to be installed should have its own BI tool and configurable dashboards. It shall provide on-line, user configurable GUI based reports of Parameters/KPIs and its graphical display for any service provider for Delhi LSA vis. a vis. the KPIs specified by TRAI. Further, it should be possible to generate reports averaged over hourly, daily, weekly, monthly and quarterly period from the data so captured, as required by TRAI. The data captured has to be stored for a period of four months. However, the consolidated data for every quarter (in formats approved by TRAI) needs to be preserved or stored for future references, trend analysis and other requirements.

2.8   All server and storage requirements including installation and configuration will be the responsibility of the vendor. The data should be aggregated daily, weekly and monthly, and this aggregated data should be kept for a user-specified time. The Agency should submit to TRAI the facilities that are available to export data to other applications.

2.9   The solution shall provide a reporting capability that will enable it to create comprehensive performance reports from a network and a customer service viewpoint. Using the GPS position the tentative area covered in the block should be graphically represented on real time basis. The report should clearly highlight the extent of coverage in a block and the number of BTS covered in the block. The Agency shall describe in their responses on technical details the range of reporting types that their solution provides, and the network technologies that it supports. The solution shall enable

performance reports to be created in hard-copy form, or viewed via a web-browser interface over the internet. A suitable browser "plug-in", if required, shall be provided to enable browser-based viewing of performance graphs. It should be possible to define new reports and save the report definitions for other users to access.

2.10 The captured on-line data is to be displayed on Network Operating centre (NOC) display panels/ wall mounted panels (which will be provided by TRAI) at the office of TRAI, New Delhi. Complete proposal for installation of processing tools and display panels shall be submitted.

2.11 The solution shall be designed so as to be highly available exceeding 97.99% excluding planned maintenance and software and hardware upgrade times. To support the availability target stated above, the solution shall be constructed using redundant components for key elements. The Agency should submit to TRAI the design features of their proposed configurations that will support this requirement.

2.12 The solution shall be able to carry out self-checks and monitor its inter-connections with all the network elements, and raise an alarm if a connection fails. Such an alarm should be automatically cleared when the failed connection is restored. System shall be able to trigger internal policy recovery mechanism to return to normal operation. The agency shall submit to TRAI the facilities available in their solution that will enable this requirement to be met.

2.13 The work includes installation of associated software/application / database server, either over cloud or physical and other installations and equipment at central location, installation of remote probes (including licensing, configuration, hosting and other software) in the Delhi LSA as per the tender, capturing of quality of service data and transmission of such data to the central server at TRAI and generation of reports.

2.14 End-to-end Random Real time Monitoring architecture (Minimum Technical Specification)

2.14.1 General

Concept of the End-to-End random real time Monitoring is to provide end-to-end simulation of the mobile subscriber's behaviour. The objective is to assure quality of experience (QoE) with a customer perspective. This part describes the functional requirements required for the correct QoE monitoring of services, as per the quality of service regulations using the end-to-end active testing system. The system should be non-intrusive i.e., should not tap / connect into any network component and should conduct testing independently.

2.14.2 Remote Subscriber Probes or agents (RP)

2.14.2.1   RP should be embedded Mobile modems for emulating mobile handsets supporting GSM, CDMA, CDMA-IX, GPRS, EDGE UMTS, HSDPA and HSDPA+technology.

2.14.2.2   RP should support network technologies up to 7Mbps for data services.

2.14.2.3   RP shall allow the mixture of any combination of different types of the above modem types (devices) in a single RP.

2.14.2.4   RP should be capable to host at least TEN physical modems of all types. The RPs should be capable of concurrently and autonomously test at least ten operators in the Delhi LSA utilizing SIMs stored locally in the agent.

2.14.2.5   RP should be capable of conducting and running test concurrently on all Installed modems.

2.14.2.6   The RPs should be capable of performing an unlimited number of back to voice calls or SMS or data browsing sessions. The number of such calls (or sessions) per hour should be limited only by the duration of the calls.

2.14.2.7   Each RP should be equipped with a GPS unit for reporting position information.

2.14.2.8   Each RP shall be equipped with internal storage to guarantee that no data is lost in case connectivity to the main server is lost.

2.14.2.9   Remote connection to central management & database server – RP should communicate with Central Server Unit (CSU) via LAN/Ethernet connectivity as well as via mobile data connection mobile GPRS/UMTS/HSDPA, supporting real-time measured data uploading and reporting of all measured KPIs and collected data.

2.14.2.10 Power Requirements: each RP should operate in stationary or mobile mode and capable to operate on all of the following voltage supply inputs

- 220VAC/110VAC (when installed in stationary mode)
- 12VDC via vehicle's battery supply (in nomadic mode)

2.14.3 Central Server Unit (CSU)

2.14.3.1 The Central Server Unit should support a distributed architecture supporting scalability to around 1000 number of RPs.

2.14.3.2 The CSU should support redundant architecture to guarantee continuous functionality in case of any single server failure.

2.14.3.3 The CSU shall be responsible for all scheduling, tests assignments/mapping and data collection from all remote RU and shall store all the data in a central database.

2.14.4 Functionality

2.14.4.1 General

2.14.4.1.1 Support all network standards and access devices (HSDPA+, HSDPA, UMTS, EDGE, GPRS, CDMA, CDMA-1X, and GSM)

2.14.4.1.2 System should support wide set of services including, but not limited to:

1.	Call Setup
2.	Voice Quality (MOS) measurements
3.	SMS including text configuration and verification.
4.	VAS SMS with the ability to configure text for VAS service and verification of received text response.
5.	Prepaid load recharging via SMS, including fetching the codes & PINs from an external file
6.	WAP Surfing with URL specification
7.	Call Attempts
8.	Call failure
9.	Call block
10.	Call set-up time
11.	Call retention rate
12.	Data session attempts
13.	Data session success rate
14.	Serving cell Id

15.	LAC
16.	MCC/MNC
17.	SID/NID
18.	RSSI
19.	Lat/Long
20.	HTTP UL/DL throughput (Min/Max/Avg)
21.	HTTP UL/DL success rate
22.	IP service set-up time (HTTP UL/DL)
23.	Ping latency (Min/Max/Avg)
24.	WAP Page load delay (Min/Max/Avg)
25.	No service
26.	IRAT handovers (3G-2G, 2G-3G)
27.	In network roaming
28.	Access technology
29.	Carrier

2.14.4.1.3 System should conduct testing on an end-to-end basis.

2.14.4.1.4 System should support tests scenarios creation only once ("Script Once") while being network technology independent (i.e. GPRS, UMTS, and HSDPA/CDMA).

2.14.4.1.5 System should support mapping of the created test scenarios to any RP, allowing its execution on any RP without the need to be changed.

2.14.4.1.6 System shall allow 24x7 testing for performance monitoring, while enabling real time view on services quality coupled with configurable alarms.

2.14.4.1.7 System should provide pre-defined and user-defined Key Performance Indicators (KPI) for Voice, Data, SMS.

2.14.4.1.8 System should support case-by-case, configuration of periodic report generation such as: daily, weekly, monthly or any other time interval.

2.14.4.1.9   System should support/ provide different formats of reports generation: e.g. web based, file export and mail forwarded reports.

2.14.4.1.10 System should support Graphical User Interface (GUI) enabling easy system operation and administration.

2.14.4.1.11 Remote agents should support tests in specific areas in a pre-scheduled or on demand (Ad-Hoc) mode.

2.14.4.1.12 System should not be required to physically enter/intrude the network of any particular service provider and should carry out all tests while being outside the network.

2.14.4.1.13 RP should be able to support tests in a specific area either as pre-scheduled tests or on demand. RP should allow its deployment on different geographical locations. Mobility of the equipment should be obvious.

2.14.4.2 Graphical User Interface (GUI)

2.14.4.2.1 System GUI should provide a user friendly, easy to use environment to arrange, edit tests and report elements.

2.14.4.2.2 System GUI environment should support user's access permission.

2.14.4.2.3 System should provide an integrated Web User Interface enabling easily set up of tests and access reports via the internet.

2.14.4.2.4 The system GUI should allow the uploading of new user created test scenarios from any PC onto the server, using its standard off the shelf web browser.

2.14.4.2.5 System should allow the uploading of any new test scenario to the server remotely from the server to all agents without any user intervention.

2.14.4.2.6 System should provide Web-based access for scenario configurable parameters, allowing fine-tuning of scenario behaviour without need to edit or re-create the entire test

2.14.4.2.7 System should provide an extended scheduler for scheduling a single test or a set of tests to run once or periodically (based on day, time and frequency), supporting multiple Outlook-style concurrent scheduling rules such as: time of day, day of week, date of the month, etc.

2.14.4.2.8 System should support "Bulk Testing" by means of creating a pre-defined test plan, providing the ability to run a pre-defined list of tests (test plan), in an ad-hoc mode, differed mode or in a pre-defined periodic repetition.

2.14.4.2.9 System should provide a dashboard tool for easy visualization, providing a snapshot of the network service level status.

KPIs for Dashboard

1. Call Attempts	13. Lat/Long	21. In Network/Roaming
2. Call Failure	14. HTTP UL/DL Throughput (Min/Max/Avg.)	22. Access Technology
3. Call Block		23. Carrier
4. Call Set-up time	15. HTTP UL/DL Success Rate	
5. Call Retention Rate		
6. Data Session Attempts	16. IP Service Set-up Time (HTTP DL/UL)	
7. Data Session Success Rate	17. Ping Latency (Min/Max/Avg.)	
8. Serving Cell Id	18. WAP Page Load Delay (Min/Max/Avg.)	
9. LAC	19. No Service	
10. MCC/MNC	20. IRAT Handovers (3G-2G, 2G-3G)	
11. SID/NID		
12. RSSI		

2.14.4.2.10 System dashboard should provide visual data on monitored services, successful/error tests, historical performance and geographical representation of the system.

2.14.4.2.11 System dashboard should allow easy customization of its look and feel, according to CUSTOMER needs, either by the vendor or by CUSTOMER.

2.14.4.3 Alarms and Reporting

2.14.4.3.1 System should provide User-configurable alarm thresholds, with warning and error level defined for each of the measured KPI's/KQI's.

2.14.4.3.2 System should provide alarm profiling, allowing the definition of number and types of alarms (warnings and/or errors) based on which a system alarm should be issued.

2.14.4.3.3 System should provide User-configurable service level thresholds, allowing the definition of SLA's, e.g. an alarm is generated if service availability falls below 95% success rate during a predefined time interval.

2.14.4.3.4 System should provide User-specified alarm definitions per each test case and per each individual measured KPI/KQI.

2.14.4.3.5 System should provide alarm forwarding to the desired destination via SNMP-traps, SMS and email.

2.14.4.3.6 System should provide configurable alarm proactive actions, i.e. user can configure any required action triggered by an alarm. For example: send an email or SMS to a predefined group of people, or reset a specific network element when a correlating alarm is triggered.

2.14.4.3.7 System should provide online (real time) reporting viewed over user interface or with an HTML browser.

2.14.4.3.8 System should provide reports, illustrated in a graphical way.

2.14.4.3.9 System should provide CDR reports for any performed test, allowing the user to configure which KPIs to be exported into the CDR e.g. call duration, SMS send time, Data volume, etc.

2.14.4.3.10 System should provide filtering of data allowing the option to restrict or format presented data.

2.14.4.3.11 Users should be able to save reports definitions for future re-use.

2.14.4.3.12 Saved reports should allow the user to save report structure for future periodic reuse as well as reports snapshot for historical analysis.

2.14.4.3.13 System should allow reports file export to other text formats (e.g. csv, txt, etc).

2.14.4.3.14 Exported reports should have no limitation on the number of exported records.

2.14.4.3.15 System should support flexible scheduling options for periodic reports, with Outlook-style rules (daily, weekly etc.) and flexible intervals.

2.14.4.3.16 System should allow the combination of multiple KPI's across multiple tests, into a single report.

2.14.4.3.17 For IP-based services (e.g. WAP, MMS), system should support packet-level capture in PCAP file format for analysis via a sniffer tool, e.g. Wire-shark.

2.14.5 Operational requirements

2.14.5.1 Stationary and Nomadic/Portable Operation mode

2.14.5.1.1 System shall allow versatile operation of the RPs in either Stationary or Nomadic/Portable mode

2.14.5.1.2 In Stationary mode, the RP should operate on 220V ac power outlet

2.14.5.1.3 In Nomadic/Portable mode, the RP should operate on 12Vdc via vehicle's battery

2.14.5.1.4 In Nomadic/Portable mode, the RP should upload its data (backhauling) in real time over a wireless data connection (UMTS/HSDPA), by using a dedicated separate channel for that.

2.14.5.2 Carrier Grade – High Availability

2.14.5.2.1 In case of failure, system shall trigger internal policy recovery mechanisms to return to normal operation.

2.14.5.2.2 System shall support high availability implementing the following capabilities.

2.14.5.2.3 RP shall monitor the availability of each of its modems, while initiating a recovery mechanism for any non-functioning modem

2.14.5.2.4 RP shall include an internal SW and HW watchdog mechanism for continuously monitoring its HW and SW elements. In case

the RU stops reacting, the internal SW watchdog shall trigger a hierarchical recovery. In case such a recovery fails the HW watchdog should REBOOT the unit.

2.14.5.2.5   System shall provide capacity/load monitoring for remote RP.

2.14.5.2.6   System shall guarantee full functionality in case of connection between RP and the main server is lost.

2.14.5.2.7   System shall continue to collect measured data in case connection between RP and the main server is lost, will store this data locally on the RP and will upload the collected data to the main server after connection is restored.

2.14.5.2.8   System shall provide /keep a live check and remote control of the RPs over the air.

2.14.5.3   Upgrade

2.14.5.3.1   System shall support remote system SW downloads and upgrades

2.14.5.3.2   The upgrade of a single RP element shall not affect the entire system performance.

2.14.5.3.3   System expansion should be seamless.

2.14.5.3.4   Central server unit upgrade shall be seamless.

2.14.5.4   Access Rights Management

2.14.5.4.1   The system shall provide access rights management to control users' access rights.

2.14.5.4.2   The system shall provide Feature-based permissions on a per-user and per-role level, up to the granularity of each User Interface feature.

2.14.5.4.3   It shall be possible to allocate different access levels for different groups of the CUSTOMER.

2.14.5.4.4   It shall be possible to add, modify, delete and query CUSTOMER logins.

2.14.6   Minimal KPI System that should be supported including, but not limited to, are given below. TRAI may include any additional KPIs as and when required and the same should be provided without any additional cost.

2.14.6.1   Voice Testing

Voice Testing (Mobile & Fixed Line)	
Parameter	**Definition**
Call Start Time	Point of time when the MT answerers the call
Call Duration	Length of time from the moment the MT-Party "pushes" the <ANSWER> button until the MT "pushes" the <Hung-UP> button
Call End Time	Point of time when the MT hangs up the call

Call Established (Call Success)	Boolean parameter that displays if the call is successfully established 1- Success; 0 - Failure
CLI	Caller Line Identification
User Time	Length of time from the moment the MO-Party "pushes" the <SEND> button until the MT "pushes" the <Hung-UP> button
CLI Availability	The percentage of call setups where a valid calling party number (CPN) parameter was sent but not received intact.
User Time Availability	Probability that a successful call attempt is ended by a cause other than the intentional termination by MO or MT party.
Failure Counter	Measurement that indicates Call Drops / Failures
Reception	Signal Strength in dBm
Cell Type	
Cell ID	
# of Call Drop	Number of Call drop per IMEI between two periodic voice events
# of Call failure	Number of calls failed between two periodic voice events
Total Placed Call	Total number of calls including successful call, drop call, failure call
Call drop rate	Call drop rate = Number of call dropped/ Total number of call made
Call fail rate	Call fail rate = Number of call failed/ Total number of calls made
RSSI	Radio signal strength indicator>Input Signal Level. Provided by Platform
Failure Code	Failure code gets generated when call connection is not established.
Drop Code	Drop code generates when call drops during an Active Call.
Call Setup Attempts	Call Setup attempts is defined as the number of times call is tried to be made when the phone is in "IN-Service" area.
No Roaming time (sec)	Time when the phone was on roaming
Aborted Call Setup	Total number of calls aborted
Average Call Duration (Sec)	Average of Call duration
No service time (secs)	Number of times device went into NO NETWROK COVERAGE
% IRAT Success Rate	Inter tech handover success rate

2.14.6.2 Data Testing

Data (WAP, HTTP, FTP) Testing	
Parameter	**Definition**
Bandwidth	Data size (kB) x 8 / (last data packet – first data packet)
Bytes Received	Received Data Size
Bytes Transmitted	Transmitted Data Size
Data Connect Delay	PDP Context Activation Accept – PDP Context Activation Request (in Seconds)
Gateway Connect Delay (Route Delay)	gateway connect complete - gateway connect request
Http Status	HTTP Status Code
DNS Host Name Resolution Time	(Standard Query Response)
Page Delay	The time to download the page without images (provided for each of the accessed pages)
Page Images Delay	The time to download all page images (provided for each of the accessed pages)
Total Receive Delay	
User Time	The time period from the moment the Customer enters the URL and hits <Return> until the complete web page appears in the MO window. In case of content download, until the content is completely downloaded.
IP Service Setup Time	The time period needed to establish a TCP/IP connection to the HTTP server, from sending the initial query to a server until the first data packet is received.
Data Connect Availability	Probability that the PDP context cannot be activated
Ping Round Trip Time	The time required for a packet to travel from a source to a destination and back
Cell Type	
Cell ID	
Ping Host	URL / HTTP Latency
Min Ping Time	Min time required to Ping
Max Ping time	Max time required to ping
Average Ping Time	Average Ping time
Success Ping Count	Number of Success Ping
Failure Ping Count	Number of failure Ping
HTTP Download Speed (kbps)	data download speed
HTTP Upload Speed (kbps)	data upload speed
FTP Download Speed (kbps)	data download speed
FTP Upload Speed (kbps)	data upload speed

% PS Retainability	Data session retention rate
% PS Accessibility	Data session accessibility rate
% CS Accessibility Multi RAB	Data session accessibility rate -Multiple Radio Access Bearer
% CS Retainability Multi RAB	Data session retention rate -Multiple Radio Access Bearer
% PS Accessibility Multi RAB	Data session accessibility rate -Multiple Radio Access Bearer
% PS Retainability Multi RAB	Data session retention rate -Multiple Radio Access Bearer
Upload Throughput - Multi RAB	
Download Throughput - Multi RAB	
Top 10 Sites Latency	Setup Latency in secs
Total PS Attempts	Total Attempts for PS
% Times RSSI > -85	% Times Signal above specified level

2.14.6.3 SMS/USSD Testing

SMS, USSD - Testing	
Parameter	**Definition**
SMS Send Delay	Length of time from the moment the MO-Party "pushes" the <SEND> key until data transfer to the SMSC is completed.
Receive SMS Delay	Length of time from the moment the MMS data transfer to the SMSC is completed until the receiving party receives the SMS notification
Success	Successful Delivery
User Time	Length of time from the moment the MO-Party "pushes" the <SEND> button until the MT receives the SMS from the SMSC
SMS Send Availability & Delay	Probability that the subscriber cannot send an SMS message despite having requested to do so by pushing the <SEND> button
Receive SMS Availability & Delay	Probability that the SMSC is not able to deliver a successfully sent SMS message to the receiving party's phone
End-to-End SMS Availability & Delay	Probability that an SMS cannot be conveyed successfully from sender to receiver, that is, a failure occurs somewhere along the line after the sender has pressed the <SEND> key
Source Reception	The signal strength of the source device
Destination Reception	The signal strength of the destination device
Cell Type	
Cell ID	

2.14.7   Itemised Bill of Material

2.14.7.1 The solution should at least include a minimal of the following items for commissioning of the Random real time monitoring system on managed services basis. The quantities projected are for evaluation purpose only. The agency is free to install any item in excess of the minimum requirement and TRAI shall not be liable for payment towards any item installed in excess of the minimum requirement. At least 02 number of remote probes to be installed in Delhi LSA shall be based on the estimates given at Annexure-3. However, the agency is free to install remote probes in excess of the minimum requirement and TRAI shall not be liable for payment towards any remote probes installed in excess of the minimum requirement.

2.15 TENTATIVE BILL OF MATERIAL

2.15.1 Central Unit Including Central Multiplexer or equivalent (including licensing, configuration, installation, hosting and softwares etc.)

S.No	Description	Location	Qty	Remarks
1	Application Server/DB/BI	At TRAI H/Q	1	
4	Wall display panels (4 Nos. of 72")	At TRAI H/Q	Will be provided by TRAI.	
5	Battery Back up at central location for the installed equipment for at least four hours	At TRAI H/Q	Will be provided by TRAI.	
6	Work stations	At TRAI H/Q	1	
7	Central SIM Multiplexer Setup or equivalent	At TRAI H/Q	1	
9	Manpower required for zonal and central locations	1 Engineer at central location and 1 technician for managing the probes.		
10	Any other items	At TRAI H/Q		

2.15.2 Remote Subscriber probes or agents (including licensing, configuration, installation, hosting and softwares etc.)

S.No	Description	Qty
1	Remote mobile subscriber Agents or probes or equivalent	2
2	Any other items	Vehicle will be provided by TRAI

3.   Miscellaneous

3.1   Expenses towards boarding, lodging and travelling for conducting this random real time monitoring of Quality of Service shall be borne by the agency itself.

3.2   TRAI at any point of time can ask for authenticity of any observation furnished for service providers. TRAI has the right to verify authenticity of each of the observations. This may also involve contacting any service provider for this purpose. Expenses towards boarding, lodging and travelling for the staff of the agency for this purpose shall also be borne by the agency itself.

4.   Reporting Formats

4.1   The Agency is required to develop data formats including executive summary, critical findings and detailed data analysis thereof for reporting the results of such random real time monitoring of Quality of Service. The agency may utilise software for reporting, preferably MS Word & MS Excel in Window environment.

4.2   The agency shall submit to TRAI sample design and sample reporting formats within 4 weeks of awarding the contract. TRAI may suggest modifications to the sample design and sample reporting formats and the agency shall modify the sample design and sample reporting formats, as suggested by TRAI, and final approval shall be taken before taking up the job in hand. The final approved design and reporting format shall be submitted by the agency within time period as specified in the delivery schedule at clause 7, after incorporating modifications/ corrections suggested by TRAI. TRAI's decision in this matter will be final.

All these reports should be enabled as online reports with sufficient flexibility of querying against various parameters.

4.3   If representative of TRAI is deputed for verification, the agency shall extend all cooperation with such representative of TRAI in the verification and he shall be supplied with all the information needed for such verification.

4.4   TRAI may also suggest changes to the reporting format at any point of time, in case it feels that such a change is necessary and the agency shall carry out such changes in the reporting format.

5.   Deliverables

5.1   **Real Time Reports:** The agency shall, through the random real time monitoring system should set up and display on real time basis the Quality of Service parameters through the remote probes moving in Delhi LSA. These reports should be web enabled and be accessible through the intranet/internet of TRAI and displayed at special panels installed by the agency at TRAI. The reports should be available for the probes every hour or day or week or month or quarter as queried in the system for any service area. The agency shall also generate reports in accordance with clause 2.10.

The agency shall compile, prepare and submit progresses reports at such periodic intervals as may be specified by the TRAI.

5.2 **Quarterly Reports:** The Agency shall submit quarterly reports in the formats approved by TRAI for the purpose. Five copies of such report covering all areas of Delhi LSA covered during the quarterly period shall be submitted to TRAI within the time period given in the delivery schedule at clause 7 below.

5.3   The reports should also be generated on line through the system installed which had taken inputs of all the service areas. The soft copies of each report shall also be submitted by the Agency along with the hard copies.

5.4   The report shall contain the results of service areas including executive summary, critical findings and comparison of performance of the service providers on various quality of service parameters for which random real time monitoring work was undertaken during the *quarter.*

5.5   Reports shall be submitted for approval within one month of the completion of each *quarter* for random real time monitoring of QOS. The report shall contain the findings on random real time monitoring of QOS. The report shall contain performance of each service provider for each licensed service area against the Quality of Service parameters. The report shall also contain a comparative analysis of performance of all the service providers in a licensed service area. The report shall also contain an Executive Summary and critical finding along with detailed analysis.

5.6   A separate report is also required to be submitted for each company/group of companies covering each circle/service area at the end of the year. The report shall also contain an Executive Summary and critical finding along with detailed analysis to share with the service provider and take further follow-up action.

6.   TRAI's Inputs

6.1   TRAI will make available the relevant Quality of Service Regulations of Cellular Services.

6.2   TRAI will make available in TRAI office space for installation of the display panels and other equipment needed for implementing the work, A.C. power supply and air conditioning.

6.3   TRAI shall make available cellular mobile SIM cards with free usage for the probes for capturing of random real time information.

7. Delivery Schedule

S. No.	Deliverable	Period
	Date of award of work as per the contract say (D)	
	For Part-A of the financial bid	
1.	Submission of all sample design and reporting formats by the Agency	D+4 weeks
2.	Submission of final design and reporting formats by the Agency incorporating modifications and corrections suggested by TRAI and its acceptance	D+10 weeks
3.	Commissioning of the random real time monitoring system. The agency shall install all the Central Units and 2 probes in Delhi LSA for first round and shall produce the reports thereupon as a part of commissioning of the random real time monitoring system.	D+10 weeks
4.	Commencement of random real time monitoring of QOS	Beginning of the quarter following date of award of work (D) or any subsequent quarter, as decided by TRAI
5.	Submission of first quarterly report	One month from the end of the first quarter
6.	Submission of second quarterly report	One month from the end of the second quarter

SECTION-III

Schedule for Financial Bid for random real time monitoring of quality of services through remote probes on managed services basis

The Agency shall submit the Financial Bid in the format given below:

Note: The rates should be inclusive of the online updating requirements of the random real time monitoring and report generation inclusive of all the taxes, levies, service taxes etc.

TENTATIVE BILL OF MATERIAL

1. Central Unit Including Central Multiplexer or equivalent (including licensing, configuration, installation, hosting and softwares etc.)

S. No.	Description	Location	Qty	Quotation for a year (Rupees in figures)	Quotation for a year (Rupees in words)
1	Application Server/ Database Server/ Business Intelligence software	At TRAI H/Q	1		
2	Wall display panels (4 Nos. of 72")	At TRAI H/Q	Will be provided by TRAI		
3	Battery Back up at central location for the installed equipment for at least four hours	At TRAI H/Q	Will be provided by TRAI		
4	Work stations	At TRAI H/Q	1		
5	Central SIM Multiplexer Setup or equivalent	At TRAI H/Q	1		
6	Manpower required for zonal and central locations				
7	Any other items	At TRAI H/Q			
	Sub-total (1)				

Note: The prices quoted should take into consideration the items that are required to be made over to TRAI at the end of the project as provided in schedule-1.

2. Remote Subscriber probes or agents (including licensing, configuration, installation, hosting and softwares etc.)

S.No	Description	Qty	Rate per unit	Quotation for a year (Rupees in figures)	Quotation for a year (Rupees in words)
1	Remote mobile subscriber Agents or probes or equivalent	2			
2	Any other items				
	Sub-total (2)				
	Total (1) **(Sub-total 1+2)**				

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SECTION-IV

TECHNICAL PROPOSAL – SAMPLE FORMATS

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The sample formats for the following are given in Form- 1 to 8 below.

Form-1   Proposal submission form.

Form-2   Comprehensive technical proposal

Form-3   Clause by clause compliance of the Technical Requirement

Form-4   Approach paper on methodology and solution architecture including hardware details and sizing indicating bidder's understanding of TRAI's requirements and emphasizing how the agency is equipped to perform the task, particularly their manpower and infrastructure capability.

Form-5   Detailed description of Proof of Concept.

Form-6   Agency's references to illustrate experience for eligibility to bid indicating past experience of the agency in undertaking works of similar nature as given in the Terms of Reference in Section-II.

Form-7   Composition of the proposed key team and tasks of each team member including supervisor.

Form-8   Curriculum Vitae of proposed professional staff.

Form-1

PROPOSAL SUBMISSION FORM

(To be submitted on Agency's letter head)

From
(Name and address of the agency)

_____

_____

To:
Joint Advisor (QOS)
Telecom Regulatory Authority of India,
Mahanagar Door Sanchar Bhawan
Jawaharlal Nehru Marg,
New Delhi-110002

Subject: Submission of tender bids for undertaking random real time monitoring of Quality of Service of service providers.

Sir,

We, the undersigned offer to provide our services for the work of random real time monitoring of Quality of Service of Cellular Mobile Telephone Services Providers for the above subject in accordance with your tender document. We are hereby submitting our Proposal which includes both technical & financial proposals, sealed under separate envelope along with EMD as per the clause 3.0 of section- I of the tender document.

Our proposal is binding upon us and subject to the modifications resulting from contract negotiations.

We understand that you are not bound to accept any bid you receive.

Dated, the.......day of 2013   Yours faithfully,

Witness: Authorized signatory:
Signature……………..   Name and Title of Signatory
Address………………   Tel. No.
                                                                  Fax No.
                                                                  E-mail address

Form-2

Comprehensive technical proposal for Random real time monitoring of Quality of Service of service providers.

Comprehensive technical proposal may be submitted along with the details of items as mentioned below indicating the relevant page numbers in the numbered technical bid:

Sl. No.	Details of Items	Compliance status and relevant page numbers
1	Complete details of infrastructure requirement like space, power, A.C. etc. at all the locations as envisaged in the proposal.	
2	Comprehensive list of deliverables needed from TRAI and Service Providers for implementation of the proposal.	
3	The details about the network elements involved and the architecture, interconnectivity details, if any.	
4	Complete proposal for installation of display panels.	
5	Itemized Bill of Material (BoM). (minimum requirements as per clause 2.14.7.1)	
6	Detailed and comprehensive list of all the deliverables by the bidder.	
7	The report generation capabilities of the system.	
8	Implementation schedule of the project with clear time limits as per the prescribed delivery schedule given in the tender document.	
9	Any other items required for the successful role out of the services.	

Authorized signatory:
Name and Title of Signatory
From
(Name and address of the Agency)
_____
_____

Form-3
Random real time monitoring of Quality of Service

Clause by Clause compliance:-

Sl. No.	Clause	Compliance
1	Clause 2.1	
2	Clause 2.2	
3	Clause 2.3	
4	Clause 2.4	
5	Clause 2.5	
6	Clause 2.6	
7	Clause 2.7	
8	Clause 2.8	
9	Clause 2.9	
10	Clause 2.10	
11	Clause 2.11	
12	Clause 2.12	
13	Clause 2.13	
14	Clause 2.14.1	
15	Clause 2.14.2 and its sub-clauses	
16	Clause 2.14.3 and its sub-clauses	
17	Clause 2.14.4 and its sub-clauses	
18	Clause 2.14.5 and its sub-clauses	
19	Clause 2.14.6 and its sub-clauses	
20	Clause 2.14.7 and its sub-clauses	
21	Clause 2.14.8 and its sub-clauses	
22	Clause 2.15 and its sub-clauses	
70	Clause 3.1	
71	Clause 3.2	
72	Clause 4.1	
73	Clause 4.2	
74	Clause 4.3	
75	Clause 4.4	
76	Clause 5.1	
77	Clause 5.2	
78	Clause 5.3	
79	Clause 5.4	
80	Clause 5.5	
81	Clause 5.6	
82	Clause 6.1	
83	Clause 6.2	
84	Clause 6.3	
85	Clause 7	

Note: It should be ensured that all the information as sought in this tender is submitted. Any other information which shall form part of the proposal may also be submitted with justification.

Authorized signatory:
Name and Title of Signatory

From
(Name and address of the Agency)
_____
_____

Form-4

(Approach paper on methodology and solution architecture including hardware details and sizing indicating bidder's understanding of TRAI's requirements and emphasizing how the agency is equipped to perform the task, particularly their manpower and infrastructure capability.)

Authorised signatory:
Name and Title of Signatory

Form-5

Detailed description of Proof of Concept

<div align="right">

Authorised signatory:
Name and Title of Signatory

</div>

Form-6

AGENCY REFERENCES
Work of similar nature carried out in the last five years
that best illustrate experience for eligibility to bid

Using the format below, provide information on each reference assignment for which your organisation was legally contracted. **(Please attach a copy of the documentary evidence supporting the assignment/ experience)**

Assignment	Country
Location within Country	Professional Staff Provided by Your Firm/entity(Profiles):
Name of Client:	No. of Staff:
Address:	No. of Staff-Months; duration of assignment
Start Date (Month/Year): Approx. Value of Services contracted	Completion Date(Month/Yr.): Rs.
Name of Associated Firm, if any	No. of Months of Professional Staff, provided by Associated Firms
Name of Senior Staff (Project Director/Coordinator, Team Leader) involved and functions performed:	
Narrative Description of Project	
Description of Actual Services Provided by Your Staff:	

Authorised signatory:
Name and Title of Signatory

Form-7

COMPOSITION OF THE TEAM PERSONNEL AND
TASK(S) OF EACH TEAM MEMBER

1.   Technical/Managerial Staff

Sl.No.	Name	Position	Task
1. 2. 3. 4.			

2.   Support Staff

Sl.No.	Name	Position	Task
1. 2. 3. 4. 5. 6. 7. 8. 9.			

Authorised signatory:
Name and Title of Signatory

Form-8

FORMAT OF CURRICULUM VITAE (CV) FOR
EACH PROPOSED PROFESSIONAL STAFF

Proposed Position: _____

Name of Firm: _____

Name of Staff: _____

Profession: _____

Date of Birth: _____

Years with Firm/Entity: _____ Nationality: _____

Membership in Professional Societies: _____

Detailed Tasks Assigned: _____

Key Qualifications:

[Give an outline of staff member's experience and training most pertinent to tasks on assignment. Describe degree of responsibility held by staff member on relevant previous assignment and give dates and locations. Use about half a page.]

Education:

[Summarize college/university and other specialized education of staff member, giving names of schools, dates attended, and degrees obtained. Use about one quarter of page]

Employment Record:

[Starting with present position, list reverse order every employment held. List all positions held by staff member in last 10 years, giving dates, names of employing organizations, titles of positions held, and locations of assignment. Also give types of activities performed and client references, where appropriate. Use about three-quarters of a page].

Languages:

[For each language indicate proficiency: excellent, good fair, or poor; in speaking, reading and writing]

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications, and my experience.

_____ Date:_____

[Signature of staff member]

Authorised signatory:
Name and Title of Signatory

PERFORMANCE BANK GUARANTEE

(To be stamped in accordance with the Stamp Act)

To

The Secretary,
Telecom Regulatory Authority of India,
Mahanagar Door Sanchar Bhawan,
Jawahar Lal Nehru Marg
New Delhi – 110002.

WHEREAS ---------- (Name and address of the firm) (hereinafter called "the Agency") has undertaken, in pursuance of Contract No.----------- dated ------- to conduct random real time monitoring of Quality of Service provided by service providers (hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Agency shall furnish you with a Bank Guarantee from a scheduled Bank in India for the sum specified herein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we (Insert name and address of Bank) have agreed to give the Agency such a Bank Guarantee:

NOW THEREFORE we (Insert name of Bank) hereby affirm that we are the Guarantors and responsible to you, on behalf of the Agency up to a total of ------------------(amount of Guarantee)--------- (in words and figures), and we hereby unconditionally, irrevocably and without demur undertake to immediately pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of -------------- (amounts of guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We (Insert name of Bank) hereby waive the necessity of your demanding the said debt from the Agency before presenting us with the demand.

We (Insert name of Bank) further agree that no change or addition to or other modification of the terms of the Contract or of the works to be performed thereunder or of any of the contract documents which may be made between you and the Agency shall in any way release us from any liability under the guarantee and we hereby waive notice of any such change, addition or modification.

We (Insert name of Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of TRAI, by virtue of the said Contract have been fully paid and its claims satisfied or discharged and till TRAI, accordingly, discharges this guarantee.

We (Insert name of Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the TRAI in writing.

This guarantee shall be valid upto and including the day of .... The pendancy of any dispute or arbitration or other proceedings shall not affect this guarantee in any manner.

Dated, the...........day of 2013

SIGNATURE AND SEAL OF THE
AUTHORISED OFFICER OF THE BANK
Name & Designation of the Officer----------------------------------
NAME OF BANK ----------------------
ADDRESS -----------------------------

DATE -------------------------

Note: The stamp papers of appropriate value shall be purchased in the name of the Bank, who issues the 'Bank Guarantee'.

Drat Master Services Agreement (MSA)

THIS AGREEMENT is executed on this the _____day of _____, 2013 between Telecom Regulatory Authority of India (TRAI) having its office at Mahanagar Doorsanchar Bhawan, J. L. Nehru Marg, New Delhi – 110002 (hereinafter called as "the Authority " as the first party, which expression shall, unless excluded by the context, include its successor and assignees), through Shri _____ working as _____ who is duly authorized to sign and execute the present agreement.

And

M/s. _____ a company/firm registered under _____ having its registered office at _____ (hereinafter referred to as the "Vendor" as the second party which expressions shall unless excluded by the context include their executors, administrators, successors and assignees) through Shri _____ who has been duly authorized vide resolution No. _____ dated _____ to execute this agreement and a copy of such authorization is appended as Appendix-I to this agreement.

WHEREAS the Authority intends to perform **the Random Real Time Monitoring of quality of service of service providers in Delhi service area** for its use,

AND WHEREAS M/s. _____ have represented to the Authority that it possesses the requisite professional skills, the technical and financial resources, and has agreed to provide the services on the terms and conditions set forth in this agreement.

Now this Agreement witnesses as follows:-

1. The Authority intends to enable the random real time monitoring of quality of service of service providers in Delhi Service area with the vision of better regulation and monitoring.

2. The Authority and the vendor have agreed to enter into this Agreement in which the vendor will design, develop, implement, operate and maintain the solution and deliver the services specifies under this Agreement and in accordance with the requirement of the Authority.

3. The Advisor (CA & QoS) or any other designated officer of the Authority shall be the person authorized by the first party to give necessary instructions to the vendor and shall be responsible for the administration of this agreement and for providing the vendor all information, which in his opinion, may be relevant to carry out the assignment under this agreement.

4. The vendor shall complete the assignment as contained in scope of work within a period of _____ commencing from _____ . The period may be extended for further period by the Authority at its discretion on the same terms and conditions.

5. The vendor shall be paid as per the payment schedule mentioned in clause no 17 of sectin-1.

6. No TA/DA shall be admissible to the vendor for local journeys performed by its staff in carrying out the assignment under this agreement.

7. As far as possible the Authority will arrange sitting arrangement in the office of the Authority for the representative of the vendor during development, installation and maintenance at the Authority premises. The facility of the internet would also be extended during that period.

8. The vendor shall not disclose to any person any document, information and /or data that may be supplied to him/it by the Authority, or by any other organization, under the directions of the Authority, or any information that may have come to its knowledge directly or indirectly by virtue of this assignment without written consent of the Authority. All such documents, data or information shall be the property of the Authority. Similarly, all reports , data, etc, to be submitted by the vendor under this agreement shall be the exclusive property of the Authority and the vendor shall not disclose the contents of such reports, data, etc, to any third party without the written consent of the Authority. This condition shall survive any foreclosure, termination or cancellation of this Agreement.

9. The vendor undertakes that this assignment shall not be in conflict with prior or current obligations of the vendor to other clients nor shall it place him/it in a position of not being able to carry out the assignments objectively and impartially.

10. The vendor shall not assign this agreement or sub-contract any portion of it without the prior written consent of the Authority.

11. The vendor shall indemnify and hold harmless the Authority against any and all claims, demands or judgement of any nature brought against the Authority arising out of the services provided by the vendor under this agreement. The Authority shall be entitled to deduct the monetary loss, if any, suffered by it from the amount payable to the vendor or in case no such amount is payable, to get the same reimbursed from the vendor. The Authority may also at its discretion terminate the agreement in such circumstances and en-cash the Performance Bank Guarantee to compensate the monetary loss suffered by it, without prejudice to the obligation of the vendor under this paragraph which shall survive the termination of this agreement.

12. The vendor undertakes to carry out the assignment in accordance with the high standard of professional and ethical competence and integrity, having due regards to the nature and purpose of the assignment, and to ensure that its staff assigned to perform services under this agreement shall conduct themselves in a manner consistent herewith.

13. The vendor shall be responsible for taking appropriate insurance coverage in respect of all matters relating to the services to be provided under this agreement, including general liability insurance so as to indemnify the Authority from any loss arising out of or in connection with services provided under this agreement.

14. The agreement, its meaning and interpretation and relations between the parties shall be governed by the laws of India as may be applicable.

15. The vendor has furnished a Performance Bank Guarantee Bond No. _____ dated _____ from _____ (Name of Bank) for an amount of Rupees _____ representing for _____ of the value of the agreement. In case, the Authority extends the duration of the agreement, the vendor agrees to extend the validity period of the Performance Bank Guarantee Bond on similar terms at least on month prior to the day of its expiry i.e. without any demand or notice or intimation from the Authority. The vendor also agrees to keep the bank guarantee valid for an extended period of six months beyond the period of this agreement. Any failure to do so shall amount to violation of the terms of this agreement and entitle the Authority to en-cash bank guarantee and to convert it into cash security without any reference to the vendor at the risk and cost of the vendor. No interest or compensation whatsoever shall be payable by the Authority on such encashment. On satisfactory completion of the work in all respects in terms of this agreement, the Performance Bank Guarantee bond shall be returned to the vendor.

16. In case of any default on the part of the vendor in completion of the work within the time schedule agreed to between the parties as herein above, the Authority shall be at liberty to get the work completed from any other vendor at the risk and cost of the vendor.

17. In the event of any dispute arising between the Authority and the vendor in any matter covered under this Agreement or arising directly or indirectly there from or connect or concerned with the said agreement in any manner of its implementation of any terms and conditions of the said agreement, the matter shall be referred to the Secretary, the Authority who may himself act as sole arbitrator or may nominate an officer of the Authority as sole arbitrator, notwithstanding the fact that such officer has been directly or indirectly associated with this agreement. The vendor will not be entitled to raise any objection for the appointment of such officer of the Authority as the sole arbitrator. The award of the arbitrator shall be final and binding on both the parties to the agreement subject to provisions of arbitration and Conciliation Act, 1996 and rules made thereunder. The parties expressly agree that the arbitration proceedings shall be held at New Delhi. The language of arbitration shall be in English only.

18. The Authority reserves right to foreclose, terminate or cancel the contract of the vendor without assigning any reasons. In such an

event, the vendor shall not be entitled to claim damages from the Authority.

19.   In respect of any matter for which no provision has been made in this agreement, the provisions contained in the general instructions of the Government on the subject for engagement of vendor shall apply.

In witness whereof the parties have hereto set and subscribed their respective hands to this agreement on the date and year appearing hereinabove.

Signed by _____, for _____, in the presence of _____.

Signed by _____, for and on behalf of the Authority in the presence of _____.

Place, New Delhi

Date

DETAILS OF CELLULAR MOBILE SERVICES FOR DELHI LSA

Sl No	Licensed Service Area	Category	Areas covered	Name of licensees (Service Provider)	Number of BTS as on 31st March 2013	Subscriber base as on 31st March 2013
1	Delhi	Metro	Local Areas served by Delhi, Ghaziabad, Faridabad, Noida, and Gurgaon Telephone Exchanges	BhartiAirtel	5216	9292512
				Vodafone India Ltd.	5265	8534062
				MTNL GSM	1113	2509030
				MTNL CDMA	222	84866
				Idea cellular	3871	4895910
				Tata CDMA	1240	3564544
				Aircel Limited	2836	2942096
				Reliance GSM	2634	4315861
				Reliance CDMA	1051	3369966
				MTS	893	917353

SCHEDULE-I

List of equipment to be handed over to TRAI

S.No	Description	Qty
1	Application Server/DB/BI	1
2	Remote mobile subscriber Agents or probes or equivalent	2
3	Software for the operation of RPs	As required